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Objectives of this study were to estimate the present and future size of the labor market for heavy equipment operators in Utah, to determine the adequacy of present operators, and to poll the construction industry for the need of state sponsored training programs. Responses were received to a mailed questionnaire from 27 employers of heavy equipment operators. Findings included: (1) These employers utilized 285 full time operators, and had 10 job openings. (2) Projected needs for the coming year totalled 52. (3) 812 seasonal operators were utilized with 233 job openings. (4) 209 job applicants had not been hired due to lack of skill. (5) Nine employers had training programs, and (6) 26 of the employers favored a state-sponsored training program. Also included are the questionnaire, occupational information, and wage information. (EM)

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FINAL REPORT

Project No. 603046
Grant No. OEG-4-7-063046-1612

HEAVY EQUIPMENT OPERATOR SURVEY

ED025664

October 1968

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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FINAL REPORT

Project No. 6-3046
Grant No. OEG-4-7-063046-1612

HEAVY EQUIPMENT OPERATOR SURVEY. Final Report.

Principal Investigator: G. Warren Gaddis
Project Director: John F. Stephens

Research Coordinating Unit
for Vocational and Technical Education, Salt Lake City, Utah
Utah State Board of Education
1400 University Club Building
Salt Lake City, Utah 84111

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SUMMARY

Problem: Utah's construction industry is an important and growing segment of the economy of the State. In several areas of specialization in the industry (carpentry, masonry, plumbing, etc.) there are numerous and extensive training programs, public and private, both inside and outside the State. However, one field for which formal, detailed training appears to be greatly limited is heavy equipment (construction or engineering equipment) operation. If heavy construction (industrial building, highways, etc.) is to continue to expand and to contribute to the growth of Utah's economy, there must be an appropriate supply of skilled, efficient workers. Engineering equipment operators form a large and important group among the population of workers in this field, but whether they are adequate in Utah in numbers and skill has been a matter of speculation and/or opinion.

The specific objectives of this study were: 1. To estimate the present and future size of the labor market for engineering equipment operators in Utah, (both full time and seasonal); 2. To determine the adequacy of the skills of operators now in the labor force; and, 3. To poll the construction industry as to a need or desire for a State-sponsored training program.

Method: Questionnaires were sent to a group of 169 building contractors having offices and licensed to operate in Utah. Except for 21 contractors which were specially chosen for reasons to be described, the names of companies to whom the questionnaire was mailed were selected randomly from the 1968 Roster of Contractors of the Utah Department of Contractors of the Commission of Business Regulation. The questionnaire was designed to elicit data showing the employment figures, employment potentials, skill level of operators, and employer attitudes and knowledge concerning training programs. Because of incomplete returns and inadequate data acquired in the validation mailing of the questionnaire, the Utah State Department of Highways was contacted as an evident unbiased principal employer of engineering equipment operators for assistance in acquiring data. As a result of the interview, 21 contractors were specially selected as mentioned above, to receive the questionnaire because, as the principal private contractors in State and Interstate highway construction and other State building projects, they were definitely known to employ engineering equipment operators. The questionnaire sent to these companies was the same as that sent to the randomly selected companies. Also queried, by means of a similar questionnaire, were the Operating Engineers Union and the Director of the Utah State Department of Highways to obtain their opinions and other relevant data they might furnish.

Conclusions: Briefly, the conclusions drawn as a result of the study were: 1. Although the returned questionnaires did not reveal that very large numbers of engineering equipment operators are now employed, they did show that the market for such tradesmen is expanding and future needs will be great enough to warrant new and expanded training programs in the State. 2. A large majority of employers indicated that most newly-hired, inexperienced operators were "poorly trained," and their skills were not always adequate. 3. The desire and need for an additional training program was also strongly indicated in the opinions expressed concerning the adequacy or present training in producing skilled workers. The contractors expressed themselves most often as being "very much in favor" of the establishment of a State-sponsored training program. For these reasons, and on the basis of several specific favorable comments by the responding contractors, it is recommended that a training program for engineering equipment operators be instituted in the near future. A follow-up of this survey may be necessary to determine the content, time, and expense of such a program.

I. INTRODUCTION

A. Statement of the Problem

Utah's construction industry is an important and growing segment of the economy of the State. In several areas of specialization in the industry (carpentry, masonry, plumbing, etc.) there are numerous and extensive training programs, both inside and outside the State, as well as those sponsored by it. However, one field for which formal, detailed training appears to be greatly limited, is engineering equipment operation. (See Appendix F, Dictionary of Occupational Titles, definition of "operating engineer, heavy equipment operator," and supplemental Department of Employment Security publications). If heavy construction (industrial building, highways, etc.) is to continue to expand and to contribute to the growth of Utah's economy, there must be an adequate supply of skilled, efficient workers in the field. Operating engineers are a large and important part of the population of workers; however, whether their numbers and skills are really adequate has not been recently investigated. This survey sought an answer to these questions.

B. Objectives

The specific objectives of this study were:

1. To estimate the present and future size of the labor market for heavy equipment operators in Utah;

2. To determine the adequacy of the skills of heavy equipment operators now in the labor force; and

3. To poll the construction industry as to the need or desire for a State-sponsored training program.

C. Hypotheses

The hypotheses of this survey were that:

1. The labor market for heavy equipment operators in Utah is growing as a result of apparent present and future expansion of heavy construction industry;

2. The occupational skills of heavy equipment operators now in the labor force are generally inadequate in comparison to the degree of skill desired by employers for their operators; and,

3. A program in Utah for training heavy equipment operators is desirable.

D. Limiting Factors

Several factors which limited the conclusions and recommendations of this study were:

1. It was not definitely known which of the numerous contractors licensed to operate in the State employed heavy equipment operators or had knowledge of needs in regard to this occupation and in the time available, all contractors could not practically be queried. Therefore, only contractors listed in the Roster of Contractors as "general building", "general engineering", or "excavating and grading , with bid limits of $150,000 or higher, were sampled. Only a brief attempt was made to show that this constituted a fair sample.

2. A small validation sample was selected and sent the questionnaire, but only a few (4 out of 10) returned it and none of these employed heavy equipment operators. This validation was considered inadequate, but time precluded more extensive efforts.

II. DESCRIPTION OF THE RESEARCH DESIGN

A. General Design

In order to accomplish the objectives of the survey the following procedure was followed (see Appendix A for PERT functional flow diagram of the research design):

1. Meeting with necessary consultants, a draft form of the questionnaire was written, and after further consultation a final form was published to be distributed as a validation survey.

2. A Roster of Contractors was obtained from the Utah Department of Contractors and from the first four pages ten names of contractors, listed as "general building," or "excavating and grading," were randomly chosen as the validation sample.

3. When after a reasonable length of time the validation sample failed to produce adequate usable data by which to determine the validity of the questionnaire and the survey sample, the Utah Department of Highways was contacted for assistance.

4. The official interviewed there indicated that only a limited number of Utah licensed contractors actually employed heavy equipment operators, and he supplied a list of those which had contracted with the State for projects. The official also indicated that, based on his knowledge, the questionnaire as it stood, would elicit the most informative data.

5. Letters and variations of the questionnaire were also sent to the Operating Engineers Union, Local #3, and the Director of the State Department of Highways for further information. (See Appendixes D and E, for copies of these letters and questionnaires and answers.)

6. The questionnaire (see Appendix B) was mailed out to 169 contractors in the State, asking for an August 16, 1968 return. (This number includes those specially selected at the suggestion of the State Department of Highways).

7. With only 25 out of the 169 questionnaires having been returned by the requested date, follow-up (reminder) letters and questionnaires were sent to the non-respondees. This follow-up requested an August 26, 1968 return. (See Appendix C for a copy of the follow-up letter).

8. On the basis of the responses received as of August 26, 1968, analysis of the data was gegun. There had been 77 questionnaires (46%) returned, 27 of which gave indication of employing heavy equipment operators. Fourteen of these employers were of the specially selected group of 21 (giving a 66% return from that group).

B. Population and Sample

The population with which this survey was concerned was comprised of all seasonal and/or full time operators of heavy equipment in the State and their employers. According to the questionnaire returned by the Operating Engineer's Union, there are 2,000 seasonal and/or full time operators employed in Utah; however, due to the time limitation on the survey the total population was not queried. In lieu thereof, a random sample survey was done which comprised 12.4% of all contractors. This is considered a fair sample in that this 12.4% of contractors employ more than 35% of the population of operators. The sample was chosen by randomly selecting, from the Roster of Contractors, the names of 2-4 contractors per page which were listed as engaged either in "general building", "general engineering", or "excavating and grading", with a bid limit not under $150,000. This bid limit was decided upon on the assumption that a company with a lower limit would not likely be engaged on projects the nature of which would involve the use of heavy equipment (unless it was sub-contracted, in which case the sub-contractor would become the subject). Also, those listed by other trades were assumed to probably not employ heavy equipment operators, and it was considered doubtful that other industries would employ any appreciable number (except for the State Department of Highways).

Also included in the sample were 21 companies which, as mentioned above, were specially suggested by the State Department of Highways as definitely employing heavy equipment operators.

Heavy equipment operators were themselves not contacted because: (1) of the difficulty in identifying them, and (2) there might be some tendency toward prejudice on their part.

C. Procedure

The procedure followed in this survey was simply to distribute the questionnaire to the sample as described above, wait for the returns, and analyze the data and draw logical conclusions to lead to recommendations. (See Appendix A, PERT functional flow diagram).

III. RESEARCH RESULTS

The data evaluated was collected by means of a questionnaire as described above. (See Appendix B, letter and questionnaire). In evaluating the data elicited in this survey, three major areas were considered:

1. Figures relating to present and projected operator needs of heavy equipment operator employers;

2. Training and skill status of operators and/or potential operators according to employer opinions; and

3. Employer opinions regarding the proposed establishment of a training program.

Because of the survey sample size limit, this report does not presume to precisely project future employment potentials nor present status; the figures are, however, considered reliable as indicators on which to base conclusions and recommendations. Employers' opinions are considered as quite reliable and a fair representation from the industry. The opinion data which was most considered in analysis was that obtained from companies which actually employ, or at some recent time employed, heavy equipment operators.

A. Present and Projected Employment

In an effort to determine, at least to a limited extent, the present status of the labor market and job market for heavy equipment operators, the first six questions asked employers were:

1. How many licensed heavy equipment operators do you employ full time at present? (i. e., all year round, not seasonal).

Total employed by respondents: 285

2. How many vacancies for full time heavy equipment operators do you have at present? (not seasonal vacancies)

Total vacancies by respondents: 10

3. How many new full time (not seasonal) heavy equipment operators do you expect to need in the coming year?

Total new needed by respondents: 52.

4. How many seasonal heavy equipment operators do you employ? (exlude year-round employees)

Total seasonal by respondents: 812

5. How many vacancies for seasonal heavy equipment operators do you usually have? (exclude vacancies for which you want year-round employees)

Total vacancies by respondents: 233

6. What has been your estimated average turnover rate per year in the last five years for full time (not seasonal) heavy equipment operators? Do you consider this a high rate?

1 - yes, 8 - no (low turnover, .005; high turnover, .100).

Table 1 reflects the answers of those who responded and had any operators in their employ, and includes the Utah State Department of Highways. (Next page).

The information received from the Operating Engineer's Union states that there are 500 heavy equipment operators employed full time, year-round at present in Utah. Represented in Table I are 35.6% of that number, employed by only 17 contractors. (The 107 operators employed by the Utah State Department of Highways are not included in the Union's figure.) Some of these employers indicate vacancies for operators which need to be filled now, but more important is the indication that the employment figures for next year will rise by 18%, and when attrition is figured into this projection, there will be a 35% replacement factor. A second significant observation to be made is the fact that these surveyed contractors also employ 54% of all seasonal operators of which the Union states there are 1,500.

The figures in the table indicate (1) that there is a definite employment increase potential for the occupation, and (2) that the current employment market is much less than saturated. Acoording to the formula:

> Presently employed operators turnover rate + present vacancies + anticipated growth = estimated requirements for the sample for the next 12 months.

There will be 78 new full-time hires required. Therefore, since 78 new hires are estimated to be required in the next 12 months for 35% of the operators, then $\frac{75}{.35}$ = 214 new hires are required for 100% of the full time operators. Similarly, $\frac{281}{.54}$ = 520 new seasonal hires are estimated to be required for 100% of the seasonal operators.

Table 1
PRESENT AND PROJECTED OPERATOR NEEDS

Firm	1. How many licensed heavy equip. operators do you employ full time at present (not seasonal)	2. How many vacancies for full time operators do you have at present? (not seasonal)	3. How many new full time (not seasonal) operators do you expect to need in the coming year?	4. How many seasonal heavy equipment operators do you employ? (exclude year-round employees)	5. How many vacancies for seasonal operators do you usually have? (exclude vacancies for which you want year-round employees)	6. What has been your estimated turnover rate per year in the last 5 years for full time operators?	Total estimated requirement for SAMPLE next 12 months: full time = no.1 x no.6 + no.3 + no.2; seasonal = no.4 x no.6 + no.5 — full time	Total estimated requirement for SAMPLE next 12 months — seasonal	Total estimated requirement for STATE next 12 months: full time = $\frac{78}{.35}$	Total estimated requirement for STATE next 12 months: seasonal = $\frac{281}{.54}$
1.	7	3	10	20	0	.20	14	4		
2.	3	0	0	2	0	.03	1	0		
3.	2	0	0	1	0	.005	0	0		
4.	15	0	3	4	3	.03	3	3		
5.	0	0	0	1	-		0	1		
6.	42	0	20	50	50	.05	22	52		
7.	0	0	0	**	**	.100	0	**		
8.	0	0	0	60-80	60-80	.50	0	73+		
9.	0	-	-	2-3	-	-	0	-		
10.	0	0	0	4	0	-	0	4		
11.	40	2	-	200	25	.25	12+	75		
12.	0	0	0	20-30	1	0	0	-		
13.	1	0	0	1	0	0	0	0		
14.	/6/*	-	-	45-75	-	-	/6/	-		
15.	0	0	0	1	1	.02	0	1		
16.	10	0	10	0	0	0	10	0		
17.	0	0	0	1	0	0	0	0		
18.	25	0	-	20	20	.25	6+	25		
19.	2	0	-	-	-	.05	-	-		
20.	1	1	1	0	1	0	2	1		
21.	0	0	-	200	15	.05	0	25		
22.	15	0	-	75-125	12	.05	1+	17		
23.	-	-	-	12	-	-	-	-		
24.	3	0	0	-	0	0	0	-		
25.	1	0	0	1	0	0	0	-		
26.	4	0	0	20	20	0	0	0		
27.	1	0	1	16	15	0	1	0		
Subtotal	178	62	45	812	233		78+	281+	214	520
Highway Dept.	107	4	7	-	-	12	24			
Total	285	10	52	812	233		102+	281+		
Op.Eng. Union	500			1,500						

* approximation on basis of statement: "90% of our work is seasonal"
**no estimate; "varies greatly"

There is an apparent and growing need for both full-time and seasonal heavy equipment operators.

B. Training and Skill Status

The seventh through eleventh questions of the survey were designed to elicit information and opinions from employers regarding the apparent adequacy of present training programs and what programs were generally known to be in existence. (Includes answers from contractors not represented in table, who do not employ operators).

7. Approximately how many heavy equipment operators who applied for positions with you in the last year were not hired due to lack of skill?

Total not hired: 209

8. Do you have any kind of training program for job applicants or employees who want to become licensed heavy equipment operators? Please briefly describe the program.

No programs: 25; programs: 9.

9. Approximately how many and which machines is one man generally qualified to operate?

1 machine -4; 2 machines -6; 3 machines -6; 4 machines -5; 4 or more machines -2.

10. Do you know of any training programs or schools in Utah or surrounding states which prepare men to become heavy equipment operators? What are the names of these schools?

Know of programs: 8; don't know of programs: 28.

11. Do you consider newly hired, inexperienced* heavy equipment operators to be _____well trained _____poorly trained?

Well trained: 1; poorly trained: 18.

Table 2 (next page) reflects the answers of all those who responded to the questionnaire and answered at least one question from the group. Again, in analysis of the data, the answers of those contractors who actually employ heavy equipment operators were considered to be of most importance.

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*An "inexperienced" operator is one that has not been previously or regularly employed in the trade and/or is one who has completed some training program and has newly entered the regular labor force. Field training is not here considered to be "experience". All employment in this regard is considered to be "entry level"; other employment in this field is as a foreman or at similar supervisory-type level.

Table 2

TRAINING AND TRAINING OPPORTUNITIES*

	Firm	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Total
Qu. 7	Appx. how many heavy equipm. op.'s who applied for positions with you in the last year were not hired due to lack of skill?	10	/	0	20	10	≈	6/8	2	2	50	10	0	/	0	0	0	10	8	0	/	50	0	0	10	0	20	209
Qu. 8	Do you have any kind of traing. program for applicants or employees who want to become licensed heavy equip. operators? Please describe:	n	n	n	n	y	y	y	/	n	y	n	n	y	n	n	n	y	n	n	y	n	y	n	n	y	n	y no 9 16
Qu. 9	Approxim. how many and which machines is one man generally qualif. to operate?																											
	1 machine			x						x			x															
	2 machines		x						x				x						x	x		x						3
	3 machines	x			≈	x	≈	≈				/		/	x	≈	≈	/			x			x					5
	4 machines										x																	5
	4+ machines																											3
																							x					1
Qu. 10	Do you know of any training progs. or schools in Utah or surrounding states which prepare men to become heavy equipm. operators?	n	n	n	n	n	y	y	n	n	y	n	n	n	n	y	n	y	n	/	y	y	n	n	y	n	n	y no 8 17
Qu. 11	Do you consider newly hired, inexperienced heavy equipmt. operators to be ( )well trained, ( ) poorly trained.	p	p	p	p	p	/	p	p	p	p	/	/	p	p	/	p	p	p	/	/	p	p	/	p	/	/	17

≈ varies greatly
n no
y yes
p poorly trained
/ no answer given

* Table does not include answers from contractors who are not presently employing operators.

On the basis of the data shown in this table, two facts become immediately apparent: (1) training is not adequate for the skills needed, and (2) few employers (36%) have their own training programs and fewer still (32%) know of other programs. Reasons for the first point above are not apparent and can only be guessed at. In regard to the second point, the fact could be attributed to either (a) inadequate publicity for existing programs, (b) a lack of programs, or (c) both inadequate publicity and a lack of programs. Those who knew of programs mentioned only the Operating Engineer's Apprenticeship Program and/or the Associated General Contractor's Apprenticeship Program (except one who mentioned the Northwest School of Engineering). In any case, this fact apparently remains: there seem to be too few training programs and these suffer from some lack of publicity.

As mentioned, answers for the inadequacy of present training programs are a matter, at this point, purely of speculation. However, survey figures show that this inadequacy definitely exists. Of all the respondees, only 33 percent apparently did not have to turn down job applicants because of lack of skill while more than half (52%) did turn down applicants for this reason. (15% gave no answer to the question). This may only show that these applicants didn't participate in a training program, but nevertheless, it also indicates that men are looking for employment, it is available, and they need to be properly trained to enter the occupation. Besides this, even among those who did not refuse applicants due to lack of skills, most said the employee was poorly trained; some gave no answer, but none said employees were well trained. The total distribution of answers was: 65% said "poorly trained" while 35% gave no answer and none said "well trained".

In addition, it is interesting to note that although it is apparently possible for one man to be able to operate more than four types of machines, onely one contractor (of 26) indicated that this was generally the case for the men he hired. (It should also be pointed out that this contractor reported having only one seasonal operator and no year-round operators). Most operators could use two or three machines, and several contractors stated that a man <u>should</u> be able to operate most machines, of which there are more than eight. (Compressors, pumps, hoists, derricks, cranes, shovels,tractors, scrapers, or motor graders).

C. <u>Establishment of Training Program</u>

The third major section of the questionnaire asked employers to state their opinions regarding the proposed establishment of a training program at Utah Technical College at Provo and to write in comments as to why they feel the way they do. Responses are reflected in Table 3, following. As in regard to the previous data described, responses which came from contractors who actually employ heavy equipment operators was considered to be most important.

Table 3

Question: Do you feel a program to train in the occupation of heavy equipment operation should be instituted at the Utah Technical College?

____Very much in favor
____somewhat in favor
____indifferent
____somewhat opposed
____very much opposed

Why do you feel this way?

_____

_____

Answers:

	employers	all others	total
Very much in favor	18	5	23
somewhat in favor	6	4	10
indifferent	1	4	5
somewhat opposed	0	1	1
very much opposed	2	1	3

As is immediately apparent, opinion was overwhelmingly "very much in favor" of establishment of a training program. Only 7 percent (2) were "very much opposed" to the proposal while 89 percent (24) were "very much in favor," or "somewhat in favor." Only one contractor was indifferent. Among contractors who did not employ operators, the distribution of opinion was approximately the same, except tending toward more neutrality.

These quoted comments summarize the favorable responses to the proposal:

"On the job training too expensive due to high wages."

"In order to maintain and operate equipment correctly, thus preventing damage and costly repairs."

"Young men who want good training in this field otherwise must leave our state for training; this is not good. Employers of these skills must do a lot of recruiting and hiring outside of the state. Training here would naturally develop a larger pool of local operators for contractors to hire from, thus keeping the wages paid in Utah spent in Utah. More training should also develop more sales of the equipment in Utah and would encourage more people to become independent contractors in the heavy equipment field."

"There has been a definite shortage of qualified operators, heavy equipment mechanics and oilers. This shortage has been severe in some areas of our work for the past seven or eight years and has been a major concern for most members in the industry."

"Due to dearth of qualified operators. Our largest asset is in construction equipment. Experienced equipment operators protect this investment, inexperienced men cost heavily in damaged equipment; training is essential."

"There is a great lack of technical tradesmen in the area and the jobs are left for theuntrained. This produces very poor quality in the workmanship."

"There are many of our young people that want but can't get training any other way. Also we need such people to keep a well-balanced employment. We need trained personnel as well as our college educated personnel."

"Utah needs to train men for all types of trades. Our schools teach that all young men should go to college; they never talk of training to work in construction."

"The rapid pace of construction and tight bidding does not allow time nor money for apprentice training."

"In deference to our present hiring arrangements, we feel that well trained operators are going to be needed in the industry. It is entirely conceivable that Utah Technical College can work out an arrangement wherein properly qualified individuals could be given the primary training and transferred on a preferred status to the industries' apprentice program."

"Our turnover in operators is negligible. We feel it would be a benefit to the construction industries in general."

"With still a large highway program for this state over the next fiscal year to be bid, there are now virtually no well-qualified operators in the union hall. The only source of operators will be from other areas and normal turnover workers from completing projects. These sources are going to be inadequate to fill our needs."

IV. CONCLUSIONS AND RECOMMENDATIONS

The major conclusions arrived at as a result of this survey included:

1. Due to an apparent growth, now and potentially, in Utah's construction industry, there is a real and growing need for well-trained, highly qualified heavy equipment operators.

2. The present training programs available in Utah are inadequate to fully qualify workers to meet the expectations of Utah's employers.

3. The large majority of employers of heavy equipment operators in Utah are very much in favor of the establishment of a training program.

In view of these conclusions the hypotheses, as stated above, are accepted, and the following recommendations are made:

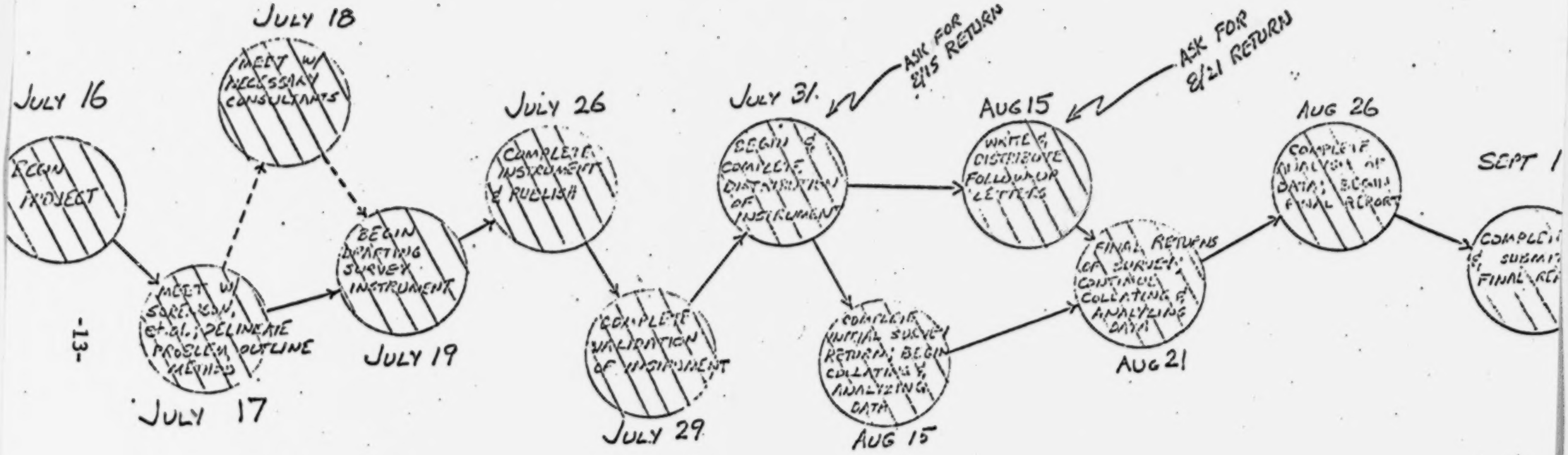
It is recommended*that:

1. Surveys and job analyses be performed to determine costs, content, and equipment for a new training program; and

2. Preparations be initiated for the establishment of a program to train heavy equipment operators in Utah.

* See Appendix G

QUALITATIVE REQUIREMENTS FOR HEAVY EQUIPMENT OPERATOR



NOTE: CROSS-HATCHED EVENTS HAVE BEEN COMPLETED

UTAH STATE BOARD OF EDUCATION

1400 UNIVERSITY CLUB BUILDING • 136 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

Office of the
STATE SUPERINTENDENT
OF PUBLIC INSTRUCTION

T. H. BELL
Superintendent

Dear Utah Contractor:

As you are probably aware, at the present time in Utah and the surrounding states there are few formal training programs to teach men how to operate heavy equipment. The Utah Research Coordinating Unit for Vocational and Technical Education of the Utah State Board for Vocational Education has been asked to conduct a survey of the State to determine whether a training program, to be instituted at the Utah Technical College at Provo, is warranted.

To gather the necessary information on which to base recommendations to the Office of the State Superintendent of Public Instruction in regard to this proposed training program we need information which can be acquired from no one but you; therefore, we would appreciate if you would complete the enclosed brief questionnaire and return it to us by August 16, 1968.

Thank you for helping to build a better Utah through better education.

Sincerely,

G. Warren Gaddis

G. Warren Gaddis, Researcher
Utah Research Coordinating Unit

GWG:mh

Enclosure 1, Questionnaire.

Appendix B

WALTER D. TALBOT, Deputy Superintendent for Administration • LERUE WINGET, Deputy Superintendent for Instruction • JAY J. CAMPBELL, Deputy Superintendent for Institutions

Please return by August 16, 1968

Firm Name:_____

Address:_____

1. _____How many licensed heavy equipment operators do you employ full time at present? (i.e., allyear round, not seasonal)

2. _____How many vacancies for full time heavy equipment operators do you have at present? (not seasonal vacancies)

3. _____How many new full time (not seasonal) heavy equipment operators do you expect to need in the coming year?

4. _____How many seasonal heavy equipment operators do you employ? (exclude year-round employees).

5. _____How many vacancies for seasonal heavy equipment operators do you usually have? (exclude vacancies for which you want year-round employees).

6. _____What has been your estimated average turnover rate per year in the last five years for full time (not seasonal) heavy equipment operators?
Do you consider this a high rate?____yes ____no
If so, to what do you attribute it?_____

_____

_____

7. _____Approximately how many heavy equipment operators who applied for positions with you in the last year were not hired due to lack of skill?

8. _____Do you have any kind of training program for job applicants or employees who want to become licensed heavy equipment operators? Please briefly describe the program:_____

_____

9. Approximately how many and which machines is one man generally qualified to operate?

_____

_____

10. _____ Do you know of any training programs or schools in Utah or surrounding states which prepare men to become heavy equipment operators? What are the names of these schools?

_____

_____

_____

11. Do you consider newly hired, inexperienced heavy equipment operators to be:

_____well trained

_____poorly trained

12. Do you feel a program to train in the occupation of heavy equipment operation should be instituted at the Utah Technical College?

_____Very much in favor

_____somewhat in favor

_____indifferent

_____somewhat opposed

_____very much opposed

Why do you feel this way?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

UTAH STATE BOARD OF EDUCATION

1400 UNIVERSITY CLUB BUILDING • 136 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

Office of the
STATE SUPERINTENDENT
OF PUBLIC INSTRUCTION

T. H. BELL
Superintendent

August 20, 1968

REMINDER

Dear Contractor:

We have not yet received back from you the questionnaire I mailed on August 8, inquiring concerning heavy equipment operators. As this survey is quite important to Utah education, and potentially to Utah industry, I would appreciate it if you could give this matter your attention as soon as possible, and return the questionnaire to us by August 26, 1968. In the event the questionnaire has been lost or misplaced, another is enclosed for your use.

Evidently only a small number of construction companies in the State employ heavy equipment operators; nevertheless, I would appreciate it if you would return the questionnaire so stating, if your's is such a company.

We need even negative answers in order to make our survey complete and to make valid recommendations.

Thank you again for your assistance and cooperation in building a better Utah.

Sincerely,

G. Warren Gaddis

G. Warren Gaddis, Researcher
Utah Research Coordinating Unit
for Vocational & Technical Education

GWG:mh

Enclosure

Appendix C

WALTER D. TALBOT, Deputy Superintendent for Administration • LERUE WINGET, Deputy Superintendent for Instruction • JAY J. CAMPBELL, Deputy Superintendent for Institutions

July 26, 1968

Operating Engineers Union
1958 West North Temple
Salt Lake City, Utah

Attention: Business Manager

Dear Sir:

The Utah Research Coordinating Unit for Vocational and Technical Education of the Utah State Board for Vocational Education has been asked to conduct a survey to determine the need for establishing, at the Utah Technical College at Provo, a training program in the occupation of heavy equipment operator. Since it is your union which represents heavy equipment operators, it is evident that any information or suggestions you could furnish us would be invaluable.

To our knowledge, there are few schools or organized training programs for this occupation presently in operation in Utah or the surrounding states. Therefore, we believe that creating such a program at the Utah Technical College will be of great benefit to the people of Utah in the labor force and to Utah's construction industry as a supplement to other training programs. However, we are not acquainted with all the requirements for entry into this occupation, nor are we sure of the present status of the job market for heavy equipment operators. We have begun a survey of construction companies in the State to gain essential information, and your organization is an additional source which can be helpful to us.

We would appreciate it if you would answer the questions on the enclosed pages giving us your suggestions and recommendations, and return the form to us by July 31, 1968.

Thank you for your assistance and cooperation.

Sincerely,

G. Warren Gaddis, Researcher
Utah Research Coordinating Unit
for Vocational and Technical Education

GWG:mh

Enclosure 1

1. How many heavy equipment operators (union and non-union) are employed in Utah at the present time?

   500 full time (year around) 0 part time

   1,500 full time (seasonal)

2. How many total vacancies for operators are there in Utah at present?

   0 full time (year around) 0 part time

   0 full time (seasonal)

3. How many licensed active heavy equipment operators (union or non-union) do you have on your roster at present? 150

4. Please briefly describe the apprenticeship program now in operation in Utah which trains heavy equipment operators (class hours required, calendar time covered, subjects required, etc.):

5. What schools or training organizations have your official approval or recognition (please include addresses):

6. By what criteria, in regard to training skill, are heavy equipment operators judged by the union and by employers?

   The employer is the only judge of qualifications.

7. Suggestions and recommendations:

July 19, 1968

Henry Hilland, Director
Utah State Department of Highways
State Capitol Building
Salt Lake City, Utah

Dear Sir:

At the present time in Utah and surrounding states there are few formal training programs to teach men how to operate heavy equipment (bulldozers, earth movers, etc.). Mr. Wilson W. Sorenson, President of the Utah Technical College at Provo, has requested the Utah Research Coordinating Unit for Vocational and Technical Education to do a survey of the state to determine whether a training program, to be instituted at the Provo campus, is warranted.

In the course of this survey we plan to find out, among other things, the number of heavy equipment operators employed in the state, the number of vacancies existing in the occupation, the rate of turnover, the number of expected new jobs, etc. We also want to find out something about existing training programs, if such information is available. On the basis of the information thus gained we will make recommendations to Mr. Sorenson and the Office of the State Superintendent of Public Instruction as to the extent of need for a state-sponsored training program for the occupation.

Since it seems evident that the State Department of Highways would employ a large percentage of the licensed heavy equipment operators in Utah, we would appreciate having your answers to the questions on the following page. We would also appreciate it if you could make recommendations to us as to who might be contacted in the State to gain further knowledge. If you have any questions concerning the survey or results, please feel free to ask them. Thank you for your assistance and cooperation.

Sincerely,

G. Warren Gaddis
Researcher

GWG:mh

Enclosure 1

1. 107 the number of licensed heavy equipment operators employed at present.

2. 4 the number of present vacancies in the heavy equipment operator field.

3. 7 the number of new heavy equipment operator positions expected to be open in the coming year.

4. 12 the average heavy equipment operator turnover rate per year in the last five years.

5. 20 the number of licensed heavy equipment operators who applied for positions but could not be employed due to lack of openings.

6. Do you have an organized training program for job applicants or employees who want to become licensed heavy equipment operators?

   ____ yes X no

7. If you do not have a training program, do you recommend a place for applicants to gain training?

   ____ yes X no

8. 52 What is the usual training time (in weeks) generally required for a person to become a qualified heavy equipment operator?

9. Approximately how many different machines is one man generally qualified to operate? 4

10. Recommendations:

    According to our Manual of Instructions, heavy duty equipment operators must be able to operate power shovels, bulldozers, power motor graders and heavy duty loaders. We also have men who operate cranes, oil distributors, transport trucks, etc.

    It is our policy to try and work men up in our crews. Medium and light equipment operators are periodically given the opportunity to operate heavy equipment and so gradually work up in the field to the heavy duty class, but sometimes it takes years.

    Our turnover in this class is mostly by retirement. Men are asked to retire at age 65, but many terminate because of our wage scale - which is far below that in the construction field. This is a factor in hiring new men. They are not interested in starting at about one-third to one-half of the usual scale paid on construction.

    We do feel that, for the most part, we have some very high-type skilled operators. We give them "on the job" training, as needed, with the help of the companies who sell the specialized equipment.

Excerpt: DOT JOB TITLE AND CODE - THIRD EDITION - SUFFIX CODES

859.883-010	Ballast-Clearning-Machine Operator	RR TRANS
859.883-014	Ballast-Regulator Operator	CONST
859.883-018	Dragline Operator	ANY IND
859.883-022	Heater -Planer Operator	CONST
859.883-026	Joint-Cleaning-and-Grooving-Machine Operator	CONST
859.883-030	Operating Engineer	CONST
859.883-034	Operating-Engineer Apprentice	CONST
859.883-038	Road-Mixer Operator	CONST
859.883-042	Road-Roller Operator	CONST
859.883-046	Sweeper Operator	CONST
859.883-050	Tamping-Machine Operator	RR TRANS
859.883-054	Walking Dragline Operator	ANY IND

OPERATING ENGINEER (any ind.) see Engineman;
see Refrigerating Engineer under Stationary Engineer; see Stationary Eng.

---(const.) 859.883. Heavy-equipment operator.

Operates several types of power construction equipment, such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers, or motor graders, to excavate and grade earth, erect structural and reinforcing steel, and pour concrete: Turns valves to control air and water output of compressors and pumps. Adjusts handwheels and presses pedals to drive machines and control attachments, such as blades, buckets, scrapers, and swing booms. May clean, oil, and grease equipment. Worker usually serves an apprenticeship during which he is instructed in the care and operation of increasingly complex machines.

UTAH JOB GUIDE

Date of Publication
15 August 1966

New DOT Code 859.883
Old DOT Code 5-23.910

OPERATING ENGINEER

The skilled manipulator of complex construction machinery is the subject of this job guide. The motive power is usually from gasoline or diesel powered engines. The man at the controls is sometimes referred to as a "Heavy" or "Construction" Equipment Operator.

NATURE OF WORK AND DESCRIPTION OF OCCUPATIONAL TASKS BASIC TO JOB

Heavy equipment operators manipulate various types of power-driven construction machinery such as shovels, derricks, cranes, hoists, pile drivers, concrete mixers, paving machines, bulldozers, tractors, scrapers, trench excavators, crushers, conveyors, backhoes, batch plants and other special-purpose machines. The skilled operator of heavy construction equipment is also known as Operating Engineer, or is known by the type of equipment or machinery that he is using.

For example, one operating engineer is known as a "Bulldozer Operator," another as a "Shovel Operator," a third as a "Batch Plant Engineer," etc. The heavy equipment operator usually specializes in and prefers to operate a certain type as well as make of machine. Most operators have the skill and are capable of adjusting to the operation of related types of equipment.

The equipment operator usually makes minor repairs and adjustments to the machine he operates. He judges the proper tension for the belts, controls, chains, frictions, etc. by inspection or the "feel" of their operations. Most machines require only one operator who must have skill and dexterity in the manipulation of numerous and complex controls. Another person besides the operator is usually responsible for keeping the machine properly lubricated with oil and grease. Actual repair work, major adjustment, and maintenance of machinery is performed by a mechanic.

WHERE DO OPERATING ENGINEERS WORK IN UTAH?

You will find heavy equipment operators working in all parts of the state wherever there is a construction project in progress. They work on roadways, dams, ditches, excavations, fills, leveling, or any other kind of earth moving. They work at building construction or wrecking sites. Work is often of short duration and there is frequent shifting to new employers. Storms and weather conditions sometimes interrupt employment and may cause seasonal delays in the completion of some types of construction work where equipment operators are employed.

WHAT ARE THE TRAINING REQUIREMENTS AND ADVANCEMENT OPPORTUNITIES?

You should plan to acquire new skills and knowledge throughout your working life as technological changes will undoubtedly affect your chosen occupation and industry. Generally Utah employers prefer to hire high school graduates who have shown an interest in and have a good understanding of such subjects as shop, science, mathematics and English. Trainees should be in good health and possess or be qualified to attain a Utah Chauffeur's license. A person planning to become a heavy duty construction equipment operator should have a good eye-hand-foot coordination, mental alertness and good depth perception. The ability to visualize the completed project is often very helpful to the operator of construction equipment.

THE UTAH STATE EMPLOYMENT SERVICE IS AFFILIATED WITH THE UNITED STATES EMPLOYMENT SERVICE. OFFICES ARE MAINTAINED AT BRIGHAM CITY, CEDAR CITY, HEBER, LOGAN, MOAB, OGDEN, PANGUITCH.

UTAH DEPARTMENT OF EMPLOYMENT SECURITY

A person should be prepared to live at or near the job site of widely separated and often isolated construction projects. The Utah Law requires that a person be at least 18 years old before working around moving machinery. No women were reported to be working in Utah at this occupation at the time of the 1960 census.

The operating engineer apprentice who has completed an approved training course will be in a position to work as a fully qualified journeyman. The more experienced workers with specialized training will usually be assigned to the more costly and complex types of machinery.

HOW MUCH CAN YOU EARN AS AN OPERATING ENGINEER?

The working contract recently negotiated in the construction industry provides for a number of wage classifications ranging from a low of about $3.50 to a high of $5.50 an hour. Job titles in the lower classifications include: Repairman Helper, Chainman, Gradesetter and Rodman. Progressing upward in the wage system are such typical jobs as Oiler, Pump Operator, One-Drum-Hoist Operator, Towermobile Operator, (small) Tractor Operator, Concrete Mixer Operator, Bulldozer Operator, Mucking Machine Operator and Repairman, Heavy Duty.

In the higher wage classifications are such typical positions as: Foreman, (5 yard) Dragline Operator, 35 Yard Rubber Tired Scraper Operator, Crawler and Truck Crane Operator (over 15 tons m.r.c. one assistant to Engineer required), Derrick Operator and similar highly responsible positions. The wage contract also provides for additional payments to engineers handling equipment with boom or jig based upon its length, as well as payments to health, welfare and pension funds.

WHAT IS EMPLOYMENT OUTLOOK FOR THIS OCCUPATION?

The trend toward the increased use of construction machinery is expected to continue during the next decade. More specialized and complex earthmoving machines as well as small equipment suitable for material handling at building sites are expected to be developed and used extensively. Several extensive Utah highways, waterworks, building and related construction projects are known to be engineered for completion during the 1960's. There will also be job openings to replace operators who get sick, retire, die or transfer to other areas or lines of work. Three thousand or more operators are expected to be employed in Utah by 1970.

WHERE CAN YOU GO FOR MORE INFORMATION OR CAREER GUIDANCE ON THIS OCCUPATION?

Any of Utah's twelve public employment offices will welcome your inquiry. Their locations are shown on the face of this job guide or in your local telephone directory. The Occupational Outlook Handbook, published by the Bureau of Labor Statistics of the U. S. Department of Labor, Washington 25, D. C., furnishes an interesting discussion of this and related occupations. The vocational counselor at your school will help you secure information on jobs and career opportunities.

You may wish to ask a journeyman tradesman or labor union official of your acquaintance for facts about this job. The Utah Apprenticeship Council, 140 West Second South Street, Salt Lake City, Utah is another place where information about training for skilled work may be requested. Your local school or public library is also a good source of printed data on most occupations of major importance in this State. Get all the facts you can, then decide wisely on a vocational goal.

UTAH JOB GUIDE

Date of Publication
1 July 1968

DOT Code 3rd Edition - Various
DOT Code 2nd Edition - Various

OPERATING ENGINEER

The occupation of the person who manipulates the controls of complex machines used to transport, lift, mix, or process heavy construction materials is the subject of this job guide.

NATURE OF THE WORK AND DESCRIPTION OF TASKS BASIC TO THE JOB.

OPERATING ENGINEERS are also sometimes known as Heavy Equipment Operators, or Dragline Operators, manipulate power-driven, diesel gasoline or electric cranes equipped with dragline bucket suspended from boom by cable that is dragged toward crane to excavate or move sand, gravel, and other materials.

OPERATING ENGINEERS may manipulate the controls of a compressed air, electric, gasoline, diesel or steam drum hoist to control movement of cableways, derricks, loaders, or skips to move men and materials for construction or industrial jobs.

OPERATING ENGINEERS may operate self-propelled grader machines to spread or level dirt and gravel to grade specifications for highways, dams, airports, and similar earthwork structures. They also operate a variety of earthmoving vehicles.

OPERATING ENGINEERS operate central mix plans for asphalt and concrete materials. They operate refrigeration plants, pumps, and compressors. They perform mechanical repair work. They operate tractors, compactors, crushers, drills, trenching machines, and conveyors, as well as other equipment.

PAY RATES OF OPERATING ENGINEERS FOR SPECIFIC TITLES.

Fringe benefits, including health, welfare, and pensions, as well as overtime, subsistence, and about $1 an hour extra for "remote" area work are provided for in the current wage contract. Typical Salt Lake area wage rates are grouped in eleven progressively skilled categories below for information purposes only. (Steel Tank Erection and Pile driving rates not included.)

OCCUPATIONAL TITLE	WAGES 1 JULY 1967	WAGES 1 JULY 1968
A-Frame Truck & Tugger Hoist	$4.79	$5.05
Adams Elegrader	5.12	5.39
Air Compressor Operator	4.35	4.58
Asphalt Plant Engineer	4.88	5.14
Asphalt Plant Fireman	4.10	4.32
Ballast Tamper or Regulator	4.44	4.68
Batch Operator (Asphalt Plant)	4.52	4.76
Brakeman, Locomotive	4.10	4.32
Bridge Crane Operator	4.88	5.14
Chainman	3.94	4.15
Chicago Boom (Stiff leg & Sheer Pole)	5.12	5.39
Chief of Party	5.12	5.39
Compactor, Self-Propelled (multiple)	5.57	5.87
Concrete Batch Plant Oper. (multiple)	5.12	5.39
Concrete Mixer Operator	4.35	4.58
Concrete Saws (Self-Propelled)	4.79	5.05
Conveyor Operator	4.10	4.32
Dragline Operator (5-7 cu. yds.)	5.57	5.87
Dragline Operator (over 7 cu. yds.)	6.17	6.47
Drilling Machine Operator (Diamond)	4.88	5.14

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UTA

174 Social Hall Avenue - Salt Lake City, Utah

OCCUPATIONAL TITLE	WAGES 1 JULY 1967	WAGES 1 JULY 1968
Elevator Operator	$4.10	$4.32
Engineer, Locomotive	4.79	5.05
Euclid Loader & Similar	5.12	5.39
Fireman	4.10	4.32
Foreman	5.30	5.58
Fork Lift Operator (Job Site)	4.79	5.05
Front End Loader (under 1 yd.)	4.44	4.68
Front End Loader (over 5 yds.)	5.12	5.39
Generator Operator (100 KWH)	4.35	4.58
Gradesetter	3.94	4.15
Helicopter Operator (Erection)	6.47	6.77
Highline Cableway Operator	5.30	5.58
Highway Cableway Signalman	5.21	5.49
Hoist Operator (1 Drum)	4.44	4.68
Hoist Operator (2 Drum)	4.88	5.14
Instrument Man	4.88	5.14
Locomotive Operator (over 100 tons)	5.30	5.58
Lubrication and Service Engineer	4.44	4.68
Material Loader Operator	4.10	4.32
Motorman	4.52	4.76
Motor Patrol Operator	5.12	5.39
Mucking Machine Operator	5.12	5.39
Partsman (field)	4.10	4.32
Partsman (shop)	3.94	4.15
Pavement Breaker Operator	4.52	4.76
Pavement Breaker (Compressor)	4.88	5.14
Pipe Bend-Clean-Wrap Machine Operator	4.79	5.05
Power Jumbo Operator	4.79	5.05
Power Shovel Operator (5-7 cu. yds.)	5.57	5.87
Power Shovel Operator (over 7 cu. yds.)	6.17	6.47
Pumpcrete Gun Operator	4.35	4.58
Refrigeration Plant Operator	4.88	5.14
Repairman, Heavy Duty (Field)	5.12	5.39
Repairman, Heavy Duty (Shop)	4.44	4.68
Repairman Helper (Shop)	3.94	4.15
Rodman	3.94	4.15
Roller Operator	4.88	5.14
Ross Carrier Operator	4.79	5.05
Shuttlecar Operator	4.52	4.76
Signalman	4.52	4.76
Slusher Operator	4.88	5.14
Sub-Grader, Automatic	5.12	5.39
Tandem Cat Operator	5.57	5.87
Tower Crane (Linden Type or Similar)	5.12	5.39
Towermobile Operator	4.52	4.76
Tractor Operator (200 AP with Attach.)	5.12	5.39
Tractor Operator (Small rubber tires)	4.52	4.76
Tractor Operator, small (sheeps foot)	4.79	5.05
Trending Machine, small	4.79	5.05
Tri-batch Paver	5.12	5.39
Tunnel Badger (mole or similar)	5.12	5.39
Universal Equipment Oper. (up to 5 yds.)	5.12	5.39
Vibrator, Maginnis Full Slab	4.79	5.05
Welder (Shop)	4.44	4.68
Welder (Field)	5.12	5.39
Welding Machine Operator (2 or more)	4.52	4.76

UTAH JOB GUIDE

Date of Publication
1 July 1968

DOT Code 3rd Edition - various
DOT Code 2nd Edition - various

CONSTRUCTION LABORER

The occupation of the person who helps a skilled craftsman construct or repair a building, roadway, or similar structure is the subject of this job guide.

NATURE OF THE WORK AND DESCRIPTION OF TASKS BASIC TO THE JOB.

LABORERS in the construction industry are primarily concerned with tasks requiring physical stamina and an inclination to routine and repetitive activities. They must be able to follow instructions and have some finger-hand dexterity, eye-hand coordination and form perception. Tolerance to heat, cold, wind, and other outdoor weather conditions is helpful to a person in this occupation.

LABORERS on building construction projects are often assigned to assist carpenters by holding lumber in position for nailing, by cleaning lumber and metal forms, by carrying materials, by digging shallow holes or trenches, by removing debris and performing similar tasks. They may also assist other craftsmen.

LABORERS may assist hoisting equipment operators by affixing rope, cable, chain, sling, or other grappling equipment to the object being lifted. They signal vocally or with hand-arm motions to guide the operator when his view is obstructed. They may also lubricate the moving parts of the equipment with oil or grease.

LABORERS may perform various manual tasks in the preparation of road right-of-ways. They may cut and burn brush; spread and level dirt and gravel; dig post holes and drainage trenches using pick and shovel. They may carry and drive stakes to show the elevation or boundary of the right-of-way.

LABORERS may operate an air hammer to break asphalt, concrete, stone, or to loosen earth, dig clay, drill holes, as well as to tamp earth in back fills. They may operate similar pneumatic or mechanical devices to puddle concrete or apply stucco or mortar to exposed surfaces. They may work above ground on scaffolds or in swings, or underground in tunnels and in caissons.

LABORERS, particularly those in the organized portion of the construction and building industry, have, through collective bargaining agreements, been granted jurisdiction in a number of specialized work areas. These areas are generally grouped in six progressively complex skill categories plus additional incentives and remuneration for those required to work underground.

PAY RATES OF CONSTRUCTION LABORERS FOR SPECIFIC TITLES.

Fringe benefits including Health, Welfare, and Pensions, as well as Overtime, Subsistence, and Travel Allowances are provided for in the current contract. Also about 75 cents an hour additional for work in certain defined "remote" areas. Typical wage rates for Salt Lake are given for informational purposes.

Occupational Title	Wages 1 July 1968	Wages 1 July 1970
Asphalt Raker	$4.00	$4.60
Belt Man	4.00	4.60
Brakeman	4.10	4.70
Bull Gang Foreman	25 cents an hour over highest classification supervised.	

A P

THE UTAH STATE EMPLOYMENT SERVICE IS AFFILIATED WITH THE UNITED STATES EMPLOYMENT SERVICE. OFFICES ARE MAINTAINED AT BRIGHAM CITY, CEDAR CITY, HEBER, LOGAN, MOAB, OGDEN, PANGUITCH, [illegible] SALT LAKE CITY AND VERNAL, UTAH

UTAH

APPENDIX G

MEMORANDUM

Mr. Aster Whitaker, District Representative, Operating Engineer's Union, Local #3, supplied the following information in an interview shortly after analysis of the survey data had been completed. This information supplements the survey conclusions and qualifies the recommendations as to type and extent of desirable training.

1. The head office of the Operating Engineer's Union, Local #3 is located at 447 Valencia Street, San Francisco, California. The General Manager is Mr. Al Clem. The Apprenticeship Administrator is Mr. D.O.Dees.

2. Operating Engineers who are employed year around in Utah, generally work for very large companies such as Kennecott, or for gravel and sand companies. Most often these year around employees are engaged, during the winter, in the repair and upkeep of equipment. (This statement supports the data received via the questionnaire which indicates that most employment in the occupation is seasonal. It also supports the information which indicates most employment is in large companies.)

In regard to the growth projections of the survey, Mr. Whitaker also supported the conclusion that the occupation is growing in numbers and new workers will be needed in the near future. Mr. Whitaker stated that large companies are often in need of qualified men during the heavy work seasons, and that frequently the only men available have been unqualified or underqualified. New men need to be trained.

4. The information Mr. Whitaker gave in regard to the skill levels of presently employed operators and men seeking employment in the occupation also corroborated the conclusions of the survey. Mr. Whitaker indicated that very frequently men who work in this occupation are untrained or only partially trained. He gave two basic reasons for this condition:

a. New kinds of complex equipment are produced each year making it difficult for the average operator to know how to operate or maintain them. Consequently, the operator appears to be untrained or poorly trained; and

b. Present training programs are frequently inadequate due largely to a lack of cooperation or too few training stations (not work stations) within the industry.

Local #3 is attempting to solve this problem in two ways:

a. A re-training program (called "Journeyman Training") was begun in California about three years ago. Located near San Francisco, its purpose is to acquaint interested journeyman operators with the new equipment in cooperation with equipment dealsers and area contractors, and returned to their jobs.

b. Mr. Dees, the Apprenticeship Administrator of Local #3, is planning a large program in California to train people for all of Local #3. The training program includes the purchase of a large tract of land near San Francisco to be used as a "Field Laboratory."

In regard to the establishment of training program by the State, Mr. Whitaker agreed that the program might be quite useful. He was cautious, however, for two main reasons:

a. New, current equipment is very expensive, ranging from $30,000 to $350,000 per item, and this does not usually include most of the more commonly used attachments. As a result, it was doubtful whether the State would be able to maintain adequate current machines, and, as noted above, it would be necessary to do so.

b. Mr. Whitaker expressed the feeling that State sponsored heavy equipment operator programs providing basic training in theory and general knowledge would be very helpful. He stressed, however, that unless the appropriate equipment were on hand in the programs, that the State-trained men would have to re-train through the regular apprenticeship program to satisfy the desires of employers.

Summarizing, Mr. Whitaker felt that if it were possible to adequately train operators in the suggested manner, most contractors, and the Union, would be glad to see this done. It would save both the Union and the employer a great deal of time and expense. It does not, on the whole, however, appear to be a feasible proposition at this time, due to the expense of training equipment.